fragments and containing 116 μg. of U_{25}*), the fission fragments being counted in a small ionization chamber from which the pulses were recorded with the same apparatus and the same modulation as those from the proton recoils from fission neutrons. Per interval of our monitor 1.2 ± .1 fissions were observed to occur on the average. If also our alloy disk were thin for slow neutrons, the number of fissions produced in it should be as much greater than in the enriched sample as the amount of U_{25} contained in it exceeds that of the enriched sample. Our alloy contained 2930 g. of the alloy and therefore $\frac{2930}{139} = 21.1$ g. of U_{25}. In order to compute, from the masses of U_{25} in the thin sample and in the tuballoy disk, respectively, the number of fissions produced in the latter, one has to correct for the self-absorption of thermal neutrons in the alloy disk. For the self-absorption in the tuballoy the following cross section values for thermal neutrons were used:

Capture cross section $\sigma_c = (3.0 \pm .3) \times 10^{-24}$ cm^2

Fission cross section $\sigma_f = (4.3 \pm .4) \times 10^{-24}$ cm^2

Scattering cross section $\sigma_{sc} = (12 \pm 2.5) \times 10^{-24}$ cm^2

The thickness of the disk was 1.3 cm which is of the same order of magnitude as the mean free path of a neutron and makes a rigorous calculation of the self-absorption quite difficult. Instead we have computed the self-absorption under three different assumptions:

a) Neglecting the scattering. This leads to a reduction factor of .58 compared to a situation in which the self-absorption in the disk would be negligible.

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